

REMARKS/ARGUMENTS

I. Specification

In the subject Office Action, the examiner required that on page 5, line 22, “weak and” be placed before “strong”. This amendment has been made. Accordingly, withdraw of the objection is respectfully requested.

II. Claim Rejections under 35 U.S.C. §112

The Examiner has rejected claims 11, 19 and 34-37 under 35 U.S.C §112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as his invention.

As to claims 11 and 19, the Examiner stated that the claim language “is misdescriptive of the present invention since such limitation is not seen as recited herein” and that “Applicant is required to particularly point out how these limitations read on the circuit arrangement of the drawings”. Using claim 11 as an example for both claims 11 and 19, Applicants show below how these claims reads on the drawings (FIGS. 2, 4A, and 4B in particular) by inserting reference numbers and signal names into the claim 11 and by pointing out antecedent basis for the claim language in the specification, as follows:

11. The apparatus according to claim 9, further comprising a pre-driver control circuit **(25)** coupled to the second stage **(24)** and the compensator circuit **(15)** and having a first voltage control delay element **(VCDE 42)** responsive to an input signal **(DATANN)** to generate a signal to turn on the second stage **(transistor n4 of strong stage 24)** and a second voltage control delay element **(VCDE 44)** responsive to the input signal **(DATANN)** and the control signal **(V_{NBIAS}TCO and V_{PBIAS}TCO over line 69)** to generate a pulse signal **(NPUSLE)** to turn off the second stage **(transistor n3 of the strong stage 24)**.

Additional support for claims 11 and 19 is provided in paragraphs 26, 27, 29 and 30 of the Applicants’ application.

With respect to method claims 34-37, the Examiner has stated that these claims depend on an apparatus claim, which is claim 31. Claims 34-37 have been amended to be dependent from method claim 33. Accordingly, withdraw of these rejections are respectfully requested.

III. Claim Rejections under 35 U.S.C. §102(b)

In the subject Office Action, claims 1-2, 14-16, 28, and 33 were rejected under 35 U.S.C. §102(b) as being anticipated by an Ilkbahar reference and as being anticipated by a Muljono reference, with the two patents having a common disclosure (e.g. same FIG. 5). In response, Applicants provides the following arguments to traverse the Examiner's rejection. It is well settled that §102 rejections require the prior art reference to anticipate each and every required elements of the invention being claimed.

A. No correction of skew in cited references

Applicants' invention is directed toward correcting for " T_{CO} LH/HL skew", not toward controlling the "slew rate", as is undertaken in the Ilkbahar reference and the Muljono reference. The fact that these two characteristics are different is specifically described in paragraph 0022 of Applicants' application as follows:

"[0022] The shape (slope) of the segments BC and DE of the pre-driver waveforms in FIG. 3 are set by the predriver weak stage 22. The slope of segments BC and DE controls the LH and HL slew-rate of the output of the driver 20. **Hence, control of slew-rate and T_{CO} are independent.**"

Applicants' application provides a detailed description of both T_{CO} LH/HL skew and slew rate, part of which will be repeated hereinafter. In paragraph 0002, slew rate is defined as follows:

"Prior art output buffers typically have a pre-driver and a driver, with the pre-driver's output waveform controlling a slew rate of the driver. The **slew rate** is the rate of change of voltage (voltage change/time) that an output buffer can generate when the driver is changing its output signal from low-to-high (LH signal transition) or high-to-low (HL signal transition)."

This definition of “slew rate” may also be found in Column 1, line 67 of the Muljono reference. In paragraph 0004 of Applicants’ application, “T_{CO} LH/HL skew” is defined in paragraph 0004 as follows:

“The term “T_{CO}” or “clock-to-output delay” is defined as the delay between a data clock and a valid output signal from the driver. The time difference in the signal switching delay periods t_{SWLH} and t_{SWHL} means that there are different T_{CO} delays for the LH and HL transitions of the output signal of the driver. The time difference between the signal switching delay periods t_{SWLH} and t_{SWHL} is defined to create “T_{CO} LH/HL skew” in the output of the driver. Hence, digital pulse signals propagating through these asymmetric logic components of the output buffer cause the output signals of the driver to be either shortened or lengthened due to T_{CO} LH/HL skew.

Claim 1 recites that “the reshaped waveform based at least in part on a difference in the clock-to-output delays of the LH and HL signal transitions”. Claim 14 recites that “a compensator circuit coupled to the driver to measure a quantity reflective of a difference between the LH and HL switching delay periods”. Claim 33 recites “determining a difference between an LH clock-to-output delay for the LH signal transitions and a HL clock-to-output delay for the HL signal transitions”. Claim 28 has been amended to include the limitations of claim 29, which the Examiner indicated would be allowable.

B. No predriver circuit with a first and a second stage in cited references

With respect to the Ilkbahar and Muljono references, the Examiner describes the pre-driver 503 of FIG. 5 as having a first stage (531-A-531C, 547D-547F, 545D-F45F) and a second stage (529A-529C, 545A-545C, 533A-533C, 547A-547C). Applicants submit that there is no teaching of two stages to the pre-driver, where the first stage generates an initial waveform and the second stage modifies the initial waveform to generate the reshaped waveform based at least in part on a difference in the clock-to-output delays of the LH and HL signal transitions, as recited in independent claim 1. To the contrary, the above cited elements of Ilkbahar are described as follows:

“Thus, with the presently described buffer 501, the slew rate at which output signals generated at pin 519 rise from low logic levels to high logic levels are controlled by

controlling the number of parallel coupled n-channel transistors 531A-C that are switched on. Conversely, the slew rate at which an output signal falls from a high logic level to a low logic level is controlled by controlling the number of parallel coupled p-channel transistors 529A-C that are switched on. The output impedance of buffer 501 from pin 519 to Vcc is controlled by controlling the number of parallel coupled p-channel transistors 521A-C are switched on and the output impedance of buffer 501 from pin 519 to ground is controlled by controlling the number of parallel coupled n-channel transistors 523A-C that are switched on.”

Likewise, there is no teaching of the second stage in communications with the compensator circuit to modify the pre-driver waveform during an adjustment period based upon the measured quantity, the adjustment period occurring during at least a portion of one of the switching delay periods, as recited in independent claim 14. Likewise, there is no teaching of compensating for the difference between the LH and HL clock-to-output delays by adjusting the rate of voltage change of the pre-driver waveform during at least part of one the switching delay periods, as recited in independent claim 33.

V. Conclusion

The Examiner has indicated that independent claim 22 and dependent claims 23-27 are allowable. The Examiner indicated that dependent claim 29 would be allowable; hence, Applicants have amended independent claim 28 to include the limitations of claim 29 so that claim 28 would be allowable. Applicants appreciate the Examiner indications of allowance.

Applicants have traversed the Examiner's rejections of independent claims 1, 14 and 33, and therefore claims dependent thereon, based upon the foregoing arguments. Applicants submit claims 1-21 and 33-37 are in condition of allowance based upon the foregoing arguments. Early issuance of Notice of Allowance is respectfully requested.

The Commissioner is hereby authorized to charge shortages or credit overpayments to Deposit Account No. 500393.

Respectfully submitted,

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Dated: _____

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